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Nicole May
Georgia State University

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The Development of Sensory and Coregulation Techniques to Improve Self-Regulation for Children Who Were Affected by Lockdown During COVID

by

Nicole May

A Capstone Project Presented to the
FACULTY OF OCCUPATIONAL THERAPY
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In Partial Fulfillment of the
Requirements for the Degree
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DEPARTMENT OF OCCUPATIONAL THERAPY
Byrdine F. Lewis College of Nursing and Health Professions

Mailing Address
P.O. Box 3995
Atlanta, GA 30302-3995

Phone 404-413-1446
Fax 404-413-1450

Georgia State University

CAPSTONE FINAL PAPER APPROVAL FORM

The Capstone Final Paper is the final product that the OTD students need to complete to report his/her Capstone Project and his/her Capstone Experience.

Student's Name	Nicole May
Degree Sought	Occupational Therapy Doctorate (OTD)
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We, the undersigned, recommend that the Capstone Final Paper completed by the student listed above, in partial fulfillment of the degree requirements, be accepted by the Georgia State University.

Sutanuka Bhattacharjya	Sutanuka Bhattacharjya	4.12.24
Faculty Mentor's Printed Name	Faculty Mentor's Signature	Date
Carol Taylor		4.23.24
Site Mentor's Printed Name	Site Mentor's Signature	Date
Carolyn Podolski	Carolyn Podolski	4.25.24
Capstone Coordinator's Printed Name	Capstone Coordinator's Signature	Date

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Abstract

The closure of schools and the resulting transition to virtual learning during COVID-19 greatly impacted young children, leading to increased irritability, aggression, and anxiety; however, no standardized protocol exists for addressing these behavioral challenges. The objective of this project was to develop a program focusing on sensory and coregulation techniques to enhance self-regulation among children who were socially and/or emotionally affected by lockdown during COVID. Caregiver surveys indicated a need for supplemental sensory input for the child's emotional regulation and social engagement; as well as supportive strategies for parents to facilitate communication and co-regulate effectively. Interviews with occupational therapists highlighted these challenges and supported the need for the SENSES program. The SENSES program provides strategies for addressing emotional regulation and difficulties with social participation. By providing an easily accessible tool and guide for caregivers, SENSES effectively addresses the challenges that children and caregivers experience post COVID.

Table of Contents

Summary Pages

Background

COVID lockdown has strongly impacted children across the globe. The closing of schools and social distancing have led to decreased peer interaction, lack of routine, and learning ability (Ebert et al., 2022). Post COVID lockdown, children have been experiencing greater behavioral and emotional challenges. “Caregivers are struggling as children are more anxious, inattentive, restless, and impulsive at school and at home” (Viner et al., 2022, pg. 400). Since the COVID lockdown, children have been struggling with emotional regulation and social skills. There is no standardized protocol to address children affected by COVID lockdown. The inability to self-regulate is interfering with daily life. Problems include difficulty transitioning, task avoidance, tantrums, impulsiveness, and being easily agitated.

Purpose Statement

The purpose of this capstone project is to develop a program focusing on sensory and coregulation techniques to improve self-regulation among children who were socially and/or emotionally affected by lockdown during COVID.

Objectives

- To identify the best strategies that caregivers can use to manage their child’s self-regulation issues (pertaining to children affected by COVID lockdown) by observing current clinical practices and completing a needs assessment.
- To develop a program that compiles the identified sensory and co-regulation strategies that parents and caregivers can use in practice.

Methodology

A pilot needs assessment was conducted by using convenience sampling to recruit clinicians working in pediatric occupational therapy clinics and parents and primary caregivers of children receiving occupational therapy services. Following consent, the caregivers and clinicians complete a survey and interviewed. A descriptive analysis was used for the survey and a content analysis for the interviews to identify current challenges and areas for need. Utilizing information from the needs assessment, and guidance from the site mentor, a program called "Sensory, Enrichment, Nurturing, Social, Emotional, Skills (SENSES)" was developed to address children's self-regulation difficulties and how children were socially &/or emotionally by COVID.

Results and conclusion

The program "SENSES", includes a guide that elaborates on sensory and coregulation techniques that parents, or caregivers can use with their child to address self-regulation. This project will have the opportunity to expand into different disciplines, such as developing a program for teachers at schools and ways to implement strategies in the classroom.

Chapter 1: Literature Review

Introduction

COVID has impacted children in many ways because of remote learning, reduced peer interaction, and the need for masking. Many children are now exhibiting difficulty in social and emotional regulation. In addition, many children are experiencing loneliness and inattentiveness and are showing signs of impulsivity and limited social skills (Raghunathan, 2022). One study with n=5823 participants reported preschoolers, ages 1-6, had increased difficulty with sleeping, increased feelings of sadness, and frequent crying (Schmidt et al., 2021). School-aged kids, ages 7-10, are experiencing more bouts of mood swings, stubbornness, and attention-seeking (Schmidt et al., 2021). Defiance was the most common trait amongst all age groups with males displaying more aggressive symptoms than females (Schmidt et al., 2021). How someone responds to a stressful situation, like COVID-19, depends on the stage of development (Schmidt et al., 2021). Reactions to distress vary with age. Schmidt et al. (2021) and Gassman-Pines et al. (2020), stated that children are exhibiting more signs of mood instability post-COVID along with an increase in parental feeling of negativity. The impact of a caregiver's work; often from home along with the child's inability to attend school, impacted a child's ability to socialize and maintain a positive level of well-being (Oberg et al., 2022). Single mothers were significantly impacted (Oberg et al., 2022). Losing loved ones and friends also impacted well-being (Oberg et al., 2022). As shown above, COVID lockdown had a negatively impacted children's social and emotional development (Oberg et al., 2022).

Attending in-person school is a vital component of a child's development. Children engage with classmates in school and learn appropriate behavior and self-awareness (Oberg et al., 2022).

Attending school is correlated with decreased risk-taking behavior and increased self-worth (Oberg et al., 2022).

According to Haig & Hallett (2023), many parents reported that the impacts of COVID-19 also created an enormous level of stress and mental strain for themselves. Often, the children then feel a loss of emotional control leading to problems with peer interaction. The transition back to school or in-person has also added stress to parents and teachers. Children are experiencing behavioral changes due to the COVID impact of being isolated at home and learning remotely for an extended period (Haig & Hallett 2023). Isolation and remote learning can affect a child's well-being for years to come.

The challenges with social skills, self-regulation, and inattentiveness did not resolve with the transition back to school (Oberg et al, 2022). After the lockdown ended, children's issues did not resolve even after six months. There is no standard protocol for parents and teachers to help children post COVID. Before COVID, interventions typically focused on using sensory integration techniques for children displaying these issues. Ideally, the same strategies can be used post-COVID. Parents and teachers also need direction on how to communicate with these children. The gap in the literature is that there are no studies on using communication, coregulation, and sensory techniques to help preschool aged children affected by COVID lockdown.

Sensory Techniques

To address behavioral issues, there are various underlying skills that can be worked on to help a child. Sensory related interventions are just one technique to address these skills (Bodison & Parham, 2017). One particular sensory intervention that has been used to address these types of challenges is called Ayres Sensory Integration (ASI). ASI is a remedial approach where

children engage in activities specifically targeting areas of need and improvement (Bodison & Parham, 2017). ASI is administered by occupational therapists and is most used in the pediatric setting (May-Benson & Koomar, 2010). About 95% of pediatric occupational therapists utilize ASI (Schaaf et al., 2018). ASI focuses on the sensory-motor foundation where treatment is based on targeted ability (Schaaf et al., 2018). To address inattention and increased arousal, vestibular activities could be used such as linear swinging and proprioceptive activities such as carrying a weighted ball as it improves body awareness (Bodison & Parham, 2017). To support attention and participation at school, sensory techniques could be used such as headphones to block out noise and compression garments (Bodison & Parham, 2017). While ASI is a therapeutic approach, sensory processing is a broader concept that allows us to organize information from the body and the environment" (Passarello et al., 2022). The use of tactile input, like the Willbarger brushing protocol, can help with emotional regulation and addressing sensory processing challenges (Bodison & Parham, 2017).

DIR/Floortime is another intervention that utilizes sensory-based techniques and is used by occupational therapists in pediatric settings. While DIR/Floortime is not exclusively sensory based, the first level primarily focuses on sensory regulation (Boshoff et al., 2020). Implementing DIR/Floortime techniques has also been found to be effective in improving social and emotional development. It was developed in the 1980s and has been mainly utilized for children with autism and their parents (Boshoff et al., 2020). "The D refers to the developmental framework" (Boshoff et al., 2020). "The I stands for underlying neurological processing differences while the R stands for relationship and subsequent affective domains" (Boshoff et al., 2020). Therapy sessions are mainly led by the child with an emphasis on pretend play and parent communication (Boshoff et al., 2020). Social skills, emotion regulation, and adaptive behavior

can be significantly improved by a child participating in DIR/Floortime (Divya et al., 2023). These skills see better outcomes if the parent is actively engaging with the child (Divya et al., 2023). The parent takes advantage of the child's interest to teach and reinforce functional skills including social communication, emotional regulation, and developmental milestones (Boshoff et al., 2020). Sensorimotor breaks are encouraged between sessions (Boshoff et al., 2020). Communication skills can also be improved and further developed with the child participating in DIR/Floortime (Divya et al., 2023).

One of the gold-standard articles outlines the effectiveness of sensory rooms in psychiatric inpatient settings. The results from this article indicate individual's felt calmer and more relaxed, less anxious, and have reduced muscle tension from using sensory rooms (Wan Yunus et al., 2015). These sensory rooms target all senses including auditory stimulation with music, tactile stimulation with soft fabrics, and proprioceptive stimulation with weighted vests and blankets (Wan Yanus et al., 2015). Addressing self-regulation and attention can help individuals bring awareness to their own body (Wan Yunus et al., 2015). To address peer interaction and behavior, sensory techniques could be used such as a weighted vest in the classroom or during social engagement (Haig & Hallett, 2023). For addressing inattention, improving alertness and emotional regulation, proprioceptive input can be used in the classroom and vestibular input can be beneficial during social interaction (Wan Yunus et al., 2015).

Language/Communication Techniques

Language is another related intervention that can address underlying factors. Language is an important piece to consider when working with children. Communication must be based on their developmental stage as it influences rapport and the child's ability to understand the caregiver (Bell & Condren, 2016). Good eye contact and communicating a topic of interest may

increase the child's comfort with the caregiver (Bell & Condren, 2016). Research has shown that parents need to be mindful of how they communicate based on gender as parents often use an authoritarian style with boys and emotion-driven with girls (Li et al., 2023).

One strategy that has been used is Parent Management Training (PMT). PMT targets disruptive behavior and promotes a willingness to comply (Booker et al., 2020). PMT utilizes clear directives, praise for positive behaviors and removal of praise or reward for poor behavior (Booker et al., 2020). Parents are highly involved in PMT and are taught strategies to handle behavior and promote rapport (Booker et al., 2020). PMT has been reported as one of the gold standards to treat children with oppositional defiant disorder (ODD) (Booker et al., 2020).

Collaborative and Proactive Solutions (CPS) is another communication technique utilized for children with ODD. CPS strives to aid parents and children collaborate in resolving issues that are leading to behavioral challenges (Booker et al., 2020).

PCIT is another evidence-based communication technique that is used by practitioners and parents when a child is presenting with disruptive behavior. It can be used for various diagnoses but is specifically used for preschool-aged children (Abrahamse et al., 2012). The technique has been proven successful across various cultures and language groups (Abrahamse et al., 2012). The parent-child relationship is extremely important in PCIT (Eyberg & Robinson, 1982). There are two parts to PCIT. Children-directed interaction (CDI) is the first part where the parent or therapist follows the child verbally and nonverbally (Eyberg & Robinson, 1982). The parent will not lead the discussion or play but instead praise positive behavior and follow play according to the child's direction. The parent will describe what the child is doing and echo back what the child says, "the train is going fast; yes the train is going very slow" (Eyberg & Robinson, 1982). Reflective phrases are used throughout. The parent is initially coached by the

therapist on how to do this. The therapist will stay in another room and coach the parent through an earpiece; providing direction based on what the child is doing or saying (Eyberg & Robinson, 1982, pg. 132). The second part of PCIT is Parent-directed interaction (PDI). However, CDI must be mastered first before beginning (Eyberg & Robinson, 1982, pg. 132). "The parent provides understandable commands, praises the child's ability to comply, and then initiates a time out procedure if needed" (Eyberg & Robinson, 1982, pg 134).

Coregulation Techniques

Coregulation enables the caregiver to keep calm to better support their child (Paley & Hajal, 2022). The caregiver's ability to regulate greatly impacts the child's ability to regulate (Paley & Hajal ,2022). By providing the child a supportive environment, the child can safely experience and manage different emotions Paley & Hajal, 2022). Jin Shin Jystu Finger Holds is a technique that has been taught to healthcare professionals and others, as a tool to calm the body. Due to the success of Jin Shin Jytsu Finger Holds as a coping mechanism with other healthcare professionals, it may be a beneficial both caregiver and child when emotions are heightened. Using this technique showed improvements in the reduction of anxiety, emotional stress, and overall morale (Millspaugh et al., 2021). Healthcare professionals were more self-aware and able to communicate in a more calm and effective manner. They were able to reduce their heart rate and calm their autonomic nervous system (Lamke et al., 2014).

EFT (Emotional Freedom Technique) or "tapping" is another technique used in helping a child regulate. This technique is a noninvasive, nonpharmaceutical, easy to learn technique that can minimize feelings of distress and anxiety (Bach et al., 2019). Tapping occurs on acupressure points of the body (Blacher, 2023). The foundation of EFT is rooted in acceptance of feelings

toward a situation. "Tapping occurs at the top of the head, eyebrow, under the eye, under the nose, under the mouth, collarbones, and ulnar side of hand" (Blacher, 2023, pg. 2).

The circle of security is another coregulation technique that is taught and used by caregivers. The circle of security methodology is often used for children who have experienced trauma or children experiencing behavioral challenges (Cassidy et al., 2017). Using this methodology creates a secure base between the child and caregiver. This provides a child with a safe haven when the child experiences obstacles or difficulties and the caregiver becomes a secure base for the child to rely on (Cassidy et al., 2017).

Deep breathing has been proven to be a beneficial technique to calm and regulate emotions. Deep breathing, also known as diaphragmatic breathing, decreases blood pressure and increases oxygenation and pulmonary function (Ma et al., 2017). Deep breathing can be used in conjunction will multiple different techniques.

Conclusion

As various studies mentioned above, sensory, communication, and coregulation techniques have been used for emotion regulation, impulsivity, disruptive behavior, and peer interaction (Raghunathan et al., 2022). These two components build the foundation for a child to be successful in school, home, and for future learning. Also, it is important for the parent to communicate at the child's development level and understand their sensory related needs. Young children impacted by COVID lack self-regulation skills, which in turn is affecting participation in school and at home. This program will provide a resource for parents to address their child's behavioral issues from the COVID lockdown.

Chapter 2: Needs Assessment

The site mentor conveyed that a new set of children were being brought to OT with emotional regulation difficulties but no formal diagnosis. COVID lockdown seemed to have affected this group of children. The caregivers had expressed to the site mentor that they were at a loss and did not have tools for helping their child at school and home. The child's inability to self-regulate had been interfering with daily life. This led me to the conclusion that a tool needed to be developed for caregivers to use with their child.

To determine the needs of SENSES, a pilot needs assessment was conducted. Semi-structured interviews were conducted with pediatric occupational therapists and paper surveys were distributed to caregivers. The research design was a pilot study. Participants were recruited through convenience sampling and were 18 years or older. Those who participated in the semi-structured interviews were clinicians working in pediatric occupational therapy. The participants filling out the surveys were caregivers of children attending pediatric occupational therapy. The caregivers were provided a paper copy of the survey.

The survey consisted of 18 questions on a four-point Likert scale. The survey had two parts: Sensory Processing and Integration and a Coregulation section. The sensory processing and integration section was aimed to help identify different sensory needs for children aged 3-8 years old. The sensory aspect of the survey had four questions related to tactile input, five questions related to proprioception input, and four related to vestibular input. *Refer to Appendix 1 for the survey.* The coregulation section consisted of five questions that related to the caregiver's ability to coregulate and communicate with their child in times of distress. The survey took caregivers no more than 15 minutes to complete. They were provided a copy of the survey at the child's session. Surveys were filled out anonymously.

The semi-structured interviews were administered by an occupational therapy doctoral student. The interviews were conducted as informal conversations with the clinicians. The interviews were intended to help gain a better understanding of how the clinician's treatment has changed post-COVID. *Refer to Appendix 2 for the interview questions.* Each interview consisted of seven open-ended questions.

Procedure

Participants who were interested in participating in the study contacted the student PI (Nicole May) by email or phone. They could also contact the PI or site mentor. At their child's sessions, parents or primary caregivers were informed about the study. Caregivers were asked to read a consent waiver before completing an anonymous paper survey. The consent form outlined the types of questions the survey entailed such as co-regulation and sensory integration and processing questions. *Refer to Appendix 1 for caregiver questions*. The caregiver survey consisted of 18 questions with a mixture of multiple choice and open-ended questions. On receiving their consent, they completed the survey, which took them no more than 15 minutes to complete. The survey was filled out anonymously with a total of eight caregivers.

In addition, three clinicians were interviewed after reading a consent form. The clinicians were asked how behavior and resulting treatment had been affected by COVID lockdown. Interviews were held during the workday. Interviews were held during the workday and were not video recorded or audio recorded.

Analysis

Descriptive analysis was used for the caregiver questionnaire. The distribution and variability of the answers were analyzed. Content analysis was used for the clinician interviews to identify common themes and patterns.

Caregiver Survey Results

Tactile Survey Results

Caregivers answered questions related to how their child responds to tactile input. Sensitivity during self-care tasks and messy play were common. Results confirmed that parents would benefit from guidance on how to address the child's irritability when performing self-care tasks *(See figure 1)*. Results on sensitivity to clothing and food were not deemed as a major issue and therefore were not included.

Proprioceptive Survey Results

Caregiver' reported frequent occurrences with difficulty sitting still at school and bumping into things. Deep pressure was noted as a helpful tool to increase body awareness and attention level *(See figure 2)*. Since these children are young, writing had not yet become an issue and therefore, results were not included.

Vestibular Survey Results

Caregivers reported issues related to movement and balance. Children craved movement and spinning around. This was seen as an indicator of children needing more vestibular input daily. However, children were not opposed to hanging upside down, riding on an elevator or escalator. Therefore, those results were not included in the charts. *(See figure 3).*

Coregulation Survey Results

Although results indicated caregivers adjusted their tone based on the situation, they still had difficulty getting their child to respond appropriately when the child was in the red zone. Therefore, all the results were included and will be addressed in SENSES the program *(See figure 4).*

Clinician Interview Results

Interview responses were similar among the clinicians. All the clinicians stated that they always educate the caregiver either during the session or post-session. Handouts and Instagram reels have been commonly used as educational tools. The main behavioral concerns post-COVID included minimal social skills and the inability to emotionally regulate. Delayed gross motor skills were also voiced as a concern, whereas fine motor skills were seen as typically intact. All clinicians reported they stay up to date on research by subscribing to AOTA and completing CEUs. (*Refer to Appendix 2 for interview question).*

Conclusion/Implication

The findings indicate that children need supplemental tactile, proprioceptive, and vestibular input for everyday functioning. Tactile defensiveness hinders their ability to carry out self-care tasks. Proprioceptive input can help reduce inattention and impulsivity and enhance learning. Caregivers report challenges in getting their child to respond to their instruction, despite attempts to adjust communication strategies. Different strategies are needed to address these challenges. Interviews show persistent issues with the child's ability to emotionally regulate and interact with peers, and further highlight the critical role caregivers play in addressing these challenges.

Chapter 3: Capstone Experience Protocol

Site Description

PlayMatters is a pediatric outpatient clinic located in Atlanta. The practice includes five occupational therapists that specialize in DIR/Floortime and sensory integration and processing. The clinicians consult with schools and provide expertise at conferences. The practice serves children with sensory processing disorder, emotional regulation issues, social skill challenges, and more. At PlayMatters, play is a key component of development, growth, and learning. Building a strong rapport with parents and children is a core value of the practice. Caregivers are included in many sessions and are provided valuable guidance that they can apply outside of therapy. Current programs include an online caregiver education handbook and weekly zoom or in person education sessions. Since a child's ability to process and integrate sensory information affects their ability to learn and attend to tasks, the practice heavily relies on vestibular, tactile, and proprioceptive input. Including caregivers in sessions helps reinforce skills at home and create a supportive environment for the child's development. The practice uses a bottom-up approach when treating patients, with the central nervous system and sensory systems being the base focus before moving onto other aspects such as sensory motor development, perceptual motor development, and cognition. The SENSES program focuses on children adversely impacted by the COVID lockdown. The program aims to provide caregivers a quick tool to use when their child is dysregulated. Also, caregivers appear to need educational tools on how to coregulate with their child. The SENSES program can easily be integrated with current programs at PlayMatters. The program will fit in naturally because sensory processing and integration are already core components of treatment.

Resources Used to Develop Program

To develop this program, I extensively researched on existing interventions for sensory-based treatment and coregulation techniques. I read articles on Ayres Sensory Integration (ASI) and DIR/Floortime. In addition, I read *Sensory Integration: Theory and Practice, 3rd edition* and *SI and The Child and* attended a conference centered on pediatric psychiatric conditions. Multiple hours were spent listening to various webinars on sensory health and wellness and sensory processing. A big takeaway from two of the webinars was how sensory-based treatment has changed. Sensory-based treatment has always been looked at from a clinical perspective. Now it is also being looked at through a wellness and lifestyle lens. The central nervous system and sensory systems are crucial and the foundation for a child's ability to learn and regulate (Ayers, 2005, pg. 43, 47). While all the senses are necessary, proprioception, vestibular, and tactile senses play a big role in behavior and ability to learn to function in everyday life (Ayres, 2005, pg. 44). Inability to process vestibular input can lead to inattention, impulsivity, and difficulty learning at school (Ayres, 2005, pg. 71). Tactile defensiveness and lack of proprioceptive input can strongly impact a child's ability to pay attention in the classroom (Ayres, 2005, pg. 44, 106). These three senses were addressed in the program.

Additionally, I focused on reading about PCIT, PMT, CPS, Grounding, Tapping, Jin Shin Jystu Finger Holds, and deep breathing. Webinars and podcasts were listened to, expanding my knowledge on PCIT and CPS. Further, I watched YouTube videos on Jin Shin Jystu Finger Holds, Grounding, and Tapping for how to perform each technique correctly.

Development of the Program

This program has been designed as a tool for caregivers to reference and easily access when their child is experiencing self-regulation issues. Providing a tool for caregivers to reference in the moment is extremely important. Bright colorful pictures with appropriate body

language are easily memorable for caregivers to reference. SENSES will provide practical scenarios including concrete steps to diffuse various types of situations. The tool will be a compilation of coregulation and sensory techniques that have been used for other traumatic events. The techniques have all been researched and published.

Communication techniques drawn upon include Collaborative Proactive Solutions (CPS) and Parent-Child Interaction Training (PCIT). Although CPS and PCIT have been used as communication techniques, SENSES uses them as coregulation techniques. CPS focuses on fostering positive behavior and building rapport between the child and caregiver. Three problem-solving steps used in CPS are: display empathy, define adult concerns, and work collaboratively with child (Greene & Winkler, 2019). These three steps provide a structured framework to use for addressing behavior challenges. PCIT is a technique used to address behavioral concerns and promote positive interaction between caregiver and child. An important component of PCIT is the acronym PRIDE. PRIDE stands for, “praise, reflect, imitate, describe, and enjoy” (Garcia et al., 2015). Incorporating the tenants and the philosophy of PCIT and CPS is beneficial for SENSES. SENSES takes the relationship-based components of CPS AND PCIT.

Additional coregulation techniques I drew from include Jin Shin Jystu Finger Holds, EFT otherwise known “Tapping”, and Grounding. Jin Shin Jystu Finger Holds is a relaxation technique where each finger is held for a certain period of time. Holding each finger targets blood flow to a certain body part. EFT, otherwise known as “Tapping”, is a coping technique that targets certain acupressure points (Blacher, 2023). These “points” are tapped 10 times with two fingers and has been shown to reduce stress and anxiety (Blacher, 2023). Lastly, grounding is another relaxation technique that has been shown to be beneficial for calming the body. Deep

breathing is emphasized in each of these techniques, as it brings increased oxygen and blood flow to the body.

Lastly, sensory techniques drawn upon were from Ayres Sensory Integration and DIR/Floortime. Proprioception, vestibular, and tactile input were key components and the foundational pieces. “Bilateral integration, praxis, and sensory reactivity are all related to these three primary functions” (Lane et al., 2019). Proprioception is in input to muscles in joints and where your body is in space, vestibular input is body movement and head position, and tactile is touch (Lane et al., 2019).

The sensory techniques recommended have been used successfully in children with similar emotional regulation issues but have different causes such as ADHD and Autism Spectrum Disorder (Sanz-Cervera et al., 2017). Also, studies, show a strong and positive relationship between the caregiver and child leads to improved behavior and emotional responses (Frosch et al., 2021; Cook et al., 2023).

Chapter 4: Results

Description of the Program

The SENSES program includes a caregiver guide for easy reference. The guide will be emailed as a pdf to the caregiver. Caregivers will be instructed on how to translate the examples into real-life situations. The guide is split into two sections: coregulation techniques and sensory techniques. Each section consists of a definition of the technique, when to use, and examples of how to apply the technique.

In the coregulation section of the guide, a definition of the CPS technique is provided. Then the three problem-solving steps are explained. This section follows with a comic of a practical scenario for how to apply the technique. There is a definition of the PCIT technique given as well. The acronym PRIDE is listed out and explained. Additional coregulation techniques are included. This includes Jin Shin Jytsu Finger Holds, Tapping, and Grounding. Definition, pictures, and benefits are provided for Jin Shin Jystu Finger Holds. A description of Tapping and the benefits of utilizing the technique are provided. Lastly, Grounding is described along with the images and benefits. Reminders to perform diaphragmatic breathing throughout these techniques are provided as well.

In the sensory section of the SENSES guide, an overview of sensory processing is covered along with definitions of ASI and DIR/Floortime. Following this, explanations of proprioception, vestibular and tactile senses are included. A comic is provided with detailed activities of proprioceptive, vestibular, and tactile input. Information is provided for how to incorporate them into daily life.

Information collected from both the caregiver surveys and clinician interviews indicated that emotional regulation and lack of social skills were two major areas of difficulty. As a result,

I put together a program integrating sensory-based strategies and coregulation techniques to address these two components. The strategies and techniques are included in the SENSES pdf guide to be used as a reference tool. The guide is designed to be utilized by a caregiver either with one child or a small group of children and addresses ages 3-8 years old. The SENSES program will initially be implemented at PlayMatters as it aligns with their goals and objectives.

Prior to distributing the guide, staff will be trained on any coregulation techniques they are not familiar with. Since staff is already familiar with sensory integration, no additional training will be needed for that piece. Staff members will be sent two research articles and two YouTube videos on PCIT and CPS to enhance their knowledge of utilizing aspects of these interventions. A one-hour group meeting will be conducted to discuss and address any questions or concerns. The meeting will be held two weeks after research articles and videos are distributed.

As for timing, the SENSES guide will be distributed to the caregiver after 6-weeks of therapy. The clinicians will only provide the guide if they notice certain indicators such as signs of distress from caregivers, reports of difficulty calming their child, and concerns about how to communicate effectively.

After roughly 12 weeks of therapy, typically the third parent meeting, occupational therapists will engage caregivers in a series of questions regarding the benefits and effectiveness of the guide (*Refer to table 1 for questions).* By asking these questions located in *table 1*, the clinicians will be able to gather feedback from caregivers on the effectiveness, clarity, and usability of the guide, in supporting their child's emotional regulation.

Chapter 5: Discussion and Impact

Several children have come into therapy with self-regulation difficulties but with no identified diagnosis. The caregivers noted that daily life has been impacted by COVID and has become a struggle. It has become apparent that the child's behavior has changed since the COVID lockdown. Children appear to have become more inattentive, impulsive, defiant, and noncompliant. There has been no documented protocol on how to work with children who have been negatively affected by COVID lockdown. Research indicates how sensory integration techniques and coregulation strategies can be beneficial for children with these types of issues. However, it has only been studied in children with other types of diagnoses. The SENSES program addresses this gap. Caregivers will be provided a SENSES guide to help their child with emotional regulation and social participation in any environment such as home or school.

Play is a child's main occupation and a key component of the SENSES guide (Brown & Lynch, 2023). Play enhances social participation, improves motor skills, and emotional regulation (Brown & Lynch, 2023). Since play is a child's main occupation, SENSES plays a role in occupational therapy (Occupational Therapy Practice Framework (OTPF): Domain and Process-Fourth Edition, 2020). Occupations encompass the various daily tasks and roles individuals engage in (OTPF: Domain and Process-Fourth Edition, 2020). Children need a secure and nurturing environment that allows them to be creative and engage with others (Brown & Lynch, 2023). COVID restrictions have affected a child's access to play in a secure and protected environment (Brown & Lynch). The sensory and coregulation techniques shown to caregivers were intended to be integrated into the child's play. Improved self-regulation allows a child to be more emotionally available (Paley & Hajal, 2022). A positive change will be seen in

peer interaction, availability to learn, relationship with caregiver. This aligns heavily with the realm of occupational therapy (Brown & Lynch, 2023).

The SENSES program has a long-lasting impact on caregivers, their children, and clinicians. In the short-term, the program provides caregiver information and tips on how to coregulate along with the child. SENSES can be utilized when the caregiver's child is impulsive, inattentive, or distressed. SENSES is an evidence-based program that occupational therapists can use to meet a child's needs. A medium-term impact of the program will be that the solutions can be incorporated into daily life practices. The program will provide knowledge for how to use and best apply sensory and coregulation techniques. The techniques can be implemented into a routine to best support the child's needs throughout the day. Lastly, the long-term impact of incorporating these techniques may reduce the need for services for children affected by COVID. The SENSES program can be transferred to other similar scenarios where emotional regulation and social participation are impacted. Scenarios may include children affected by trauma or other types of pandemics. Children mistreated or abandoned have also been observed to exhibit regulation issues such as hyperarousal (Da Silva, 2011). This kind of trauma has been shown to impact and affect or even change the way sensory information is processed (Da Silva, 2011). SENSES could be a useful tool for those children affected by trauma. Furthermore, the trauma affects neural connections in the brain (Da Silva, 2011). Movement and tactile input play a vital role in emotional and physical maturation (Da Silva, 2011). The most important developmental period is before the age of seven (Matson et al., 2023). If trauma occurs before that age, it can really impact sensory and motor development; also resulting in lasting impacts on neural connections (Matson et al., 2023). Neglect can cause the child to be limited in normal play;

thereby causing negative impact to the child's development and resulting behavior (Da Silva, 2011). Using the SENSES program in therapy could be beneficial for these children.

Limitations

Participants were recruited through convenience sampling which may increase the risk of bias. Since participants were only recruited from one occupational therapy site, there is a risk of generalization. Due to this small sample size and limited recruitment, the study may not represent all caregivers. Further research should expand the sample size and include a more diverse population to increase the potential applicability of the program. Another limitation is how the program was geared and developed specifically for caregivers. Other settings were not considered which then limits the scope of the program. Healthcare professionals, teachers, or daycare would benefit from the program as well and should be included in further research.

Sustainability Plan

To sustain this capstone project, guidelines will need to be developed for any new hires, so they are familiar with the program. The owner will develop the new hire guidelines. These guidelines will be reviewed and adjusted on an annual basis. Training on the guidelines will include sensory processing and coregulation protocol for children affected by COVID lockdown. The training will consist of two one-hour sessions. The first session will entail the effects of behavior due to COVID lockdown and how proprioceptive, vestibular, and tactile input can be used to address these behaviors. The second session will explain how coregulation is imperative to the success of treatment. Additional resources such as research articles and videos will be available if the new hires need further instruction.

SENSES will eventually be expanded for classroom use. The program will be modified to address behavioral challenges in the classroom. Teachers will easily be able to integrate the principles when working with children affected by COVID lockdown. Another capstone student or occupational therapist will collaborate with preschools, local elementary schools, and parent support groups, focusing on how sensory and coregulation techniques can support these children. To facilitate this, contact spreadsheets will be created and referrals will be documented. Occupational therapists will conduct one-hour observation sessions in the identified classrooms to assess the need for a SENSES program. When needs are identified in the classroom, teachers and school staff will be provided a flyer including sensory techniques for classroom integration. One year after collaborating with preschools and local elementary schools, an occupational therapist will speak and share their experience with Georgia State OT capstone students. Understanding how children were affected by COVID will be emphasized along with how to integrate this program into future practice.

Conclusion

In conclusion, SENSES addresses the need for children who have faced social and emotional challenges due to COVID lockdown. Existing research on sensory integration and coregulation techniques has been shown to be beneficial for similar circumstances. SENSES uses the same techniques to help caregivers coregulate and children emotionally regulate. Children are guided on how to recognize and process their emotions. This enables them to be more successful at school and home when it comes to problem-solving, learning, and attending to tasks. SENSES provides a framework for caregivers so they can establish a supportive environment and focus on building strong relationships with their child.

Currently, SENSES focuses on caregivers only. However, the implications of this capstone project have the potential to go beyond the context of the COVID-19 pandemic. Future research should explore the adaptability of these techniques to other circumstances, such as pandemics, natural disasters, or other types of traumas. Additionally, the program could be adapted and utilized in different environments, such as preschool and elementary school classrooms. In the realm of occupational therapy, social isolation, heightened anxiety, and behavioral challenges all affect the ability to complete daily life activities. By addressing these difficulties, occupational therapists play a key role in supporting children's overall well-being and ability to engage in meaningful occupations.

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Figures

Figure 1: Tactile Survey Caregiver Results

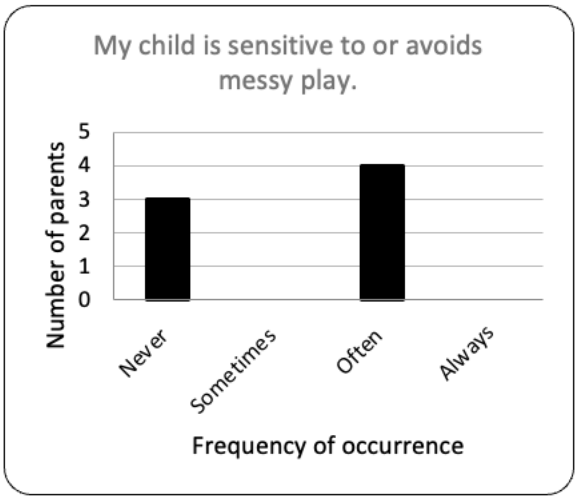


Figure 1a

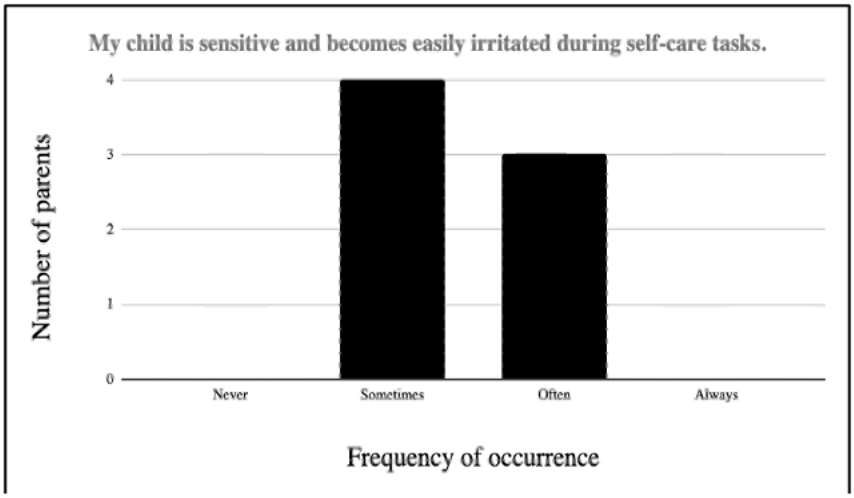
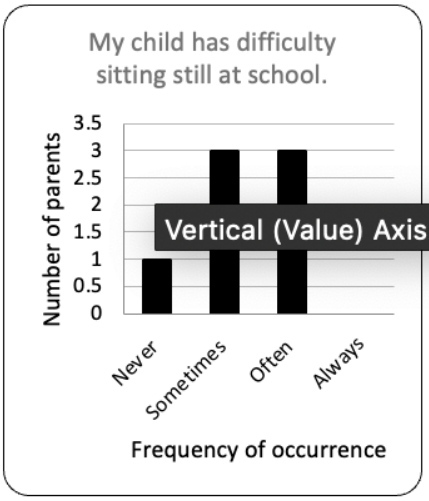


Figure 1b

Figure 2: Proprioception Caregiver Survey Results



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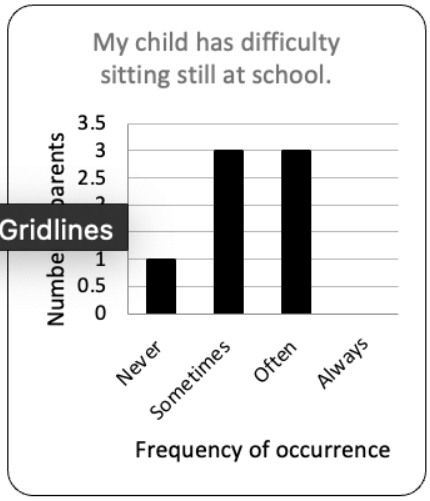

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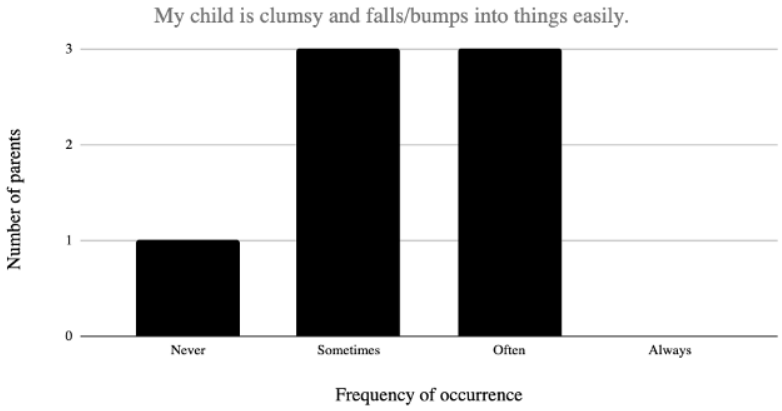


Figure 2c

Figure 3: Vestibular Caregiver Survey Results

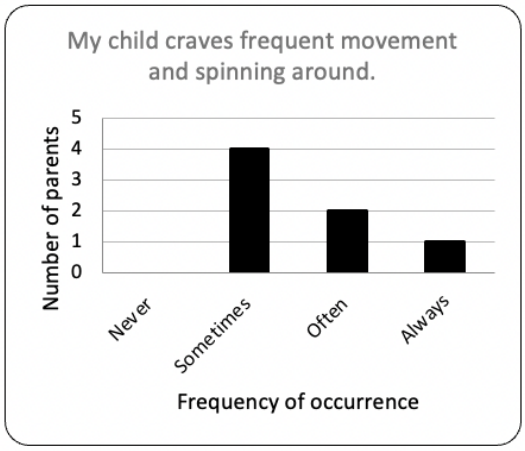


Figure 3a

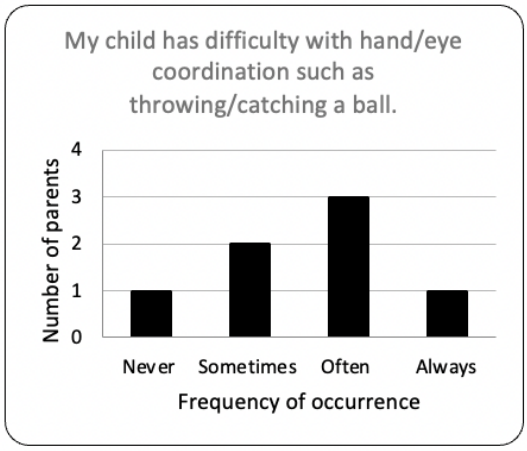


Figure 3b

Figure 4: Coregulation Caregiver Survey Results

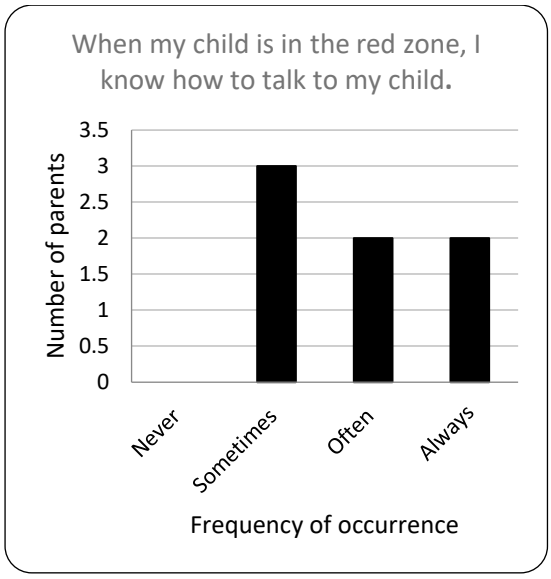
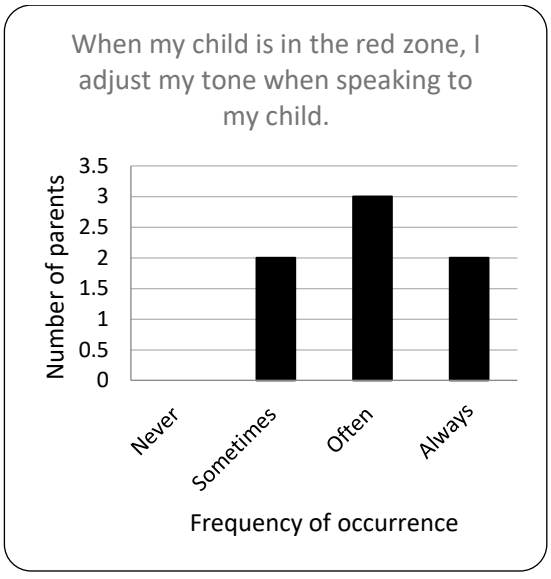


Figure 4a



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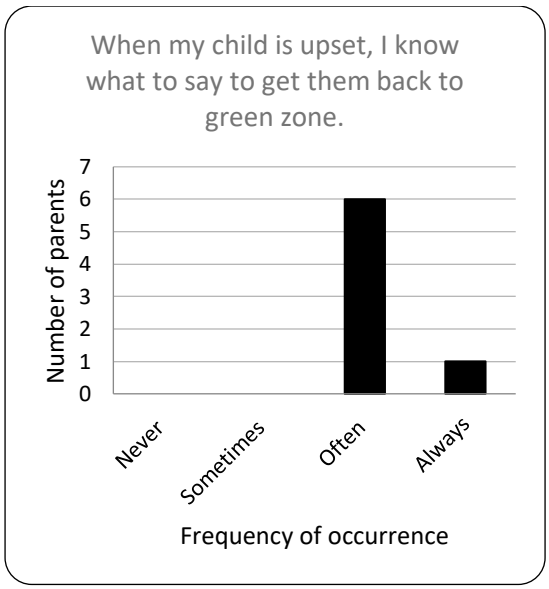

Figure 4c

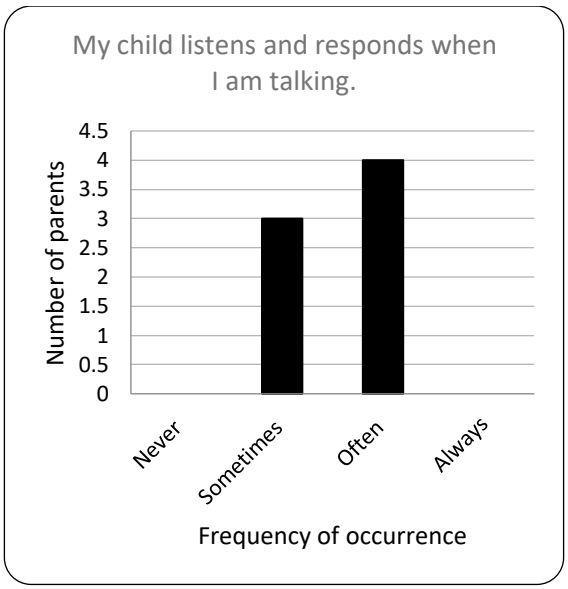

Figure 4d

Tables

Table 1: Caregiver Satisfactory Survey

	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
The strategies provided are easy to use and follow.					
I feel confident in my ability and understanding to apply these techniques to help my child.					
I have gained knowledge on strategies to improve my child's emotional regulation.					
I found the coregulation techniques to be effective.					
I found the sensory techniques to be effective.					
Answer two questions below.					
Is there any additional information you believe should be included in the guide?					
How frequently did you use the strategies provided in the guide?					

Appendix

Appendix 1: Caregiver Survey

Caregiver Survey

The following survey consists of a set of questions were handed out to caregivers at PLAYMatters to gain information on how they can co-regulate with their child when they are dysregulated and what sensory something they are having difficulties with. Here is a little background information before you start the survey.

Sensory processing is a term that refers to how the nervous system interprets and responds to sensory information from the environment. If a child has sensory processing difficulties they may have challenges with self-care tasks, emotional regulation, or play. There are seven senses that are part of the sensory system and they all work together to process information. The seven senses are auditory (sound & auditory input), gustatory (taste), olfactory (smell) proprioception (where your body is in space), tactile (touch), vestibular (balance, gravity, movement), and visual (vision). Occupational therapists can play a vital role in helping individuals improve their ability to receive sensory input through therapeutic activities and challenges.

Part I: Sensory

Does my child have tactile difficulties:

- My child is sensitive and becomes easily irritated when wearing certain articles of clothing.
    - Never
    - Sometimes
    - Often
    - Always

- My child has aversion to touching or tasting certain textures of food.
    - Never
    - Sometime
    - Often
    - Always
- My child is sensitive and becomes easily irritated during self-care tasks.
    - Never
    - Sometimes
    - Often
    - Always
- My child is sensitive to or avoids messy play.
    - Never
    - Sometimes
    - Often
    - Always

Do they have proprioceptive difficulties:

- My child has difficulty sitting still at school.
    - Never
    - Sometimes
    - Often
    - Always
- My child has trouble with personal space (e.g., gets too close to others).

    - Never
    - Sometimes
    - Often
    - Always

- When my child is irritated or impulsive, deep pressure can help to calm such as a hug or a weighted blanket.
    - Never
    - Sometimes
    - Often
    - Always
- My child applies too much pressure when writing.
    - Never
    - Sometimes
    - Often
    - Always
- My child is clumsy and falls/bumps into things easily.
    - Never
    - Sometimes
    - Often
    - Always

Do they have vestibular difficulties:

- When taking my child to the playground, they avoid going on the swings or going upside down.
    - Never
    - Sometimes
    - Often
    - Always
- My child avoids going on escalators or elevators.
    - Never
    - Sometimes
    - Often
    - Always
- My child craves frequent movement and spinning around.
    - Never
    - Sometimes
    - Often
    - Always
- My child has difficulty with hand/eye coordination such as throwing/catching a ball.
    - Never
    - Sometimes
    - Often
    - Always

Part II: Co-regulation

Occupational therapists use the term "engine" in describing how the body feels and responds to stimuli. Children learn how to identify their own high or low engine and taught how to regulate themselves by "zone." Regulation is divided into 4 zones-red zone (angry, out of control), blue zone (tired, bored, sad), green zone (calm, happy, focused), and yellow zone (wiggly, upset).

- When my child is in the red zone, I know how to talk to my child.
    - Never
    - Sometimes
    - Often
    - Always
- When my child is in the red zone, I adjust my tone when speaking to my child.
    - Never
    - Sometimes
    - Often
    - Always
- I understand what increases my child’s engine.
    - Never
    - Sometimes
    - Often
    - Always.
- When my child is upset, I know what to say to get them back to green zone.
    - Never
    - Sometimes
    - Often

    - Always

- My child listens and responds when I am talking.
    - Never
    - Sometimes
    - Often
    - Always

Appendix 2: Clinician Interviews

Clinician Interview questions

1. Has your treatment approach changed post-pandemic?
    a. If so, how?
2. Are you educating caregivers on steps for home and school?
    a. What mode of delivery have you found to be most beneficial?
3. Do you incorporate sensory integration and sensory processing techniques into treatment?
4. Do you incorporate coregulation/communication techniques into treatment?
5. What are the top behavioral concerns you're seeing post-COVID?
6. Would you name/describe some of the bigger/overarching challenges that you are noticing with children?
7. Have you been able to obtain the latest research on children affected by COVID lockdown?

Appendix 3: Learning Objectives

- Long-Term Objective 1: To identify best strategies that caregivers can use to manage their child's self-regulation issues (pertains to children affected by COVID lockdown) by observing current clinical practices and completing a needs assessment.
    - Short-term objective 1: Student will observe techniques currently being used in clinical practice by end of week 2
        - Learning Activity: Student will document and discuss techniques with site mentor.
        - Learning Activity: Student will complete a written report of techniques used by clinician during therapeutic activities.
    - Short-term objective 2: Student will complete needs assessment by the end of week 4.
        - Learning Activity: Student will conduct survey with caregiver.
        - Learning Activity: Student will research different sensory strategies observed in clinical practice.
- Long Term Objective 2: To develop a program that compiles the identified sensory and co-regulation strategies that parents and caregivers can use in practice.
    - Short term objective 1: Student will determine best way to educate caregivers.
        - Learning Activity: Student will conduct informal interviews with all onsite occupational therapists. Purpose is to gather information about their past experiences with caregivers.
        - Learning Activity: Documentation of informal interviews with therapists.

- Short term objective 2: Student will develop a program for caregivers; sensory and coregulation strategies.
    - Learning Activity: Student will meet with mentor to discuss any potential changes and final revisions.

Appendix 4: Supervision Plan

Student responsibilities		Site mentor responsibilities	
Topic	Description	Topic	Description
Roles/responsibilities	-Student will be respectful and constantly communicate with site mentor, capstone coordinator, and capstone faculty to ensure everything is going smoothly. -Student will work together with site mentor on goals, objectives, evaluation, and supervision plan. -Student will complete 560 hours of the capstone experience. -Student will complete literature review before start of Capstone experience. -Respond appropriately to constructive criticism from site mentor, faculty, and capstone coordinator. -Complete and disseminate capstone project within a timely manner and while following the capstone guidelines.	Roles/responsibilities	-Introduce student to site, expectations, policies and procedures, workflow, workspace access, and stakeholders. -Collaborate with student, capstone coordinator, and faculty member throughout the capstone experience. -Site mentor will work together with student on objectives, goals, and plan for supervision. -Sign MOU -Site mentor will provide onsite supervision and mentoring. -Collaborate and guide student through needs assessment. -Provide constructive feedback to student based on expertise. -Pass on expertise knowledge by allowing student to observe sessions and providing contacts (stakeholders, caregivers, etc.) -Evaluating performance at midterm and final. -If student fails to meet expectations or due date, mentor will

			talk to student first to understand why. -Review and sign student's time log of onsite/off site hours.
Scheduled meetings	The student will collaborate with site mentor to establish a weekly routine time to meet for 30 minutes via phone call or in person. During the meeting, student's progress will be reviewed as well as what preparation needs to be done for the next task. The student will be able to meet with site mentor outside of established routine time as needed.	Scheduled meetings	The site mentor will collaborate with the student to establish a weekly routine time to meet for 30 minutes via phone call or in person. During the meeting, student's progress will be reviewed as well as what preparation needs to be done for the next task. The site mentor will be able to meet with site mentor outside of established routine time as needed.
Communication Methods	Student will communicate with site mentor by text, phone call, email, or in person.	Communication method/resolve disputes	-Site mentor will communicate with student by text, phone call, email, or in person.
Specific requirements	-The capstone experience is 14 weeks long with a total of 560 hours completed. A time log will be developed to track deliverables and ensure deadlines are being met. The student will create	Specific requirements	-The site mentor will ensure the student is completing 560 hours with no more than 20% of work being completed outside the site. The site mentor will review the time long to ensure deliverables are being submitted on time.

	a timeline detailing when deliverables are expected to be completed. The student and site mentor will initial the time log at the end of each week and sign the bottom of the timeline at the end of the capstone experience. -If deliverables are not completed on time, the student will work with the site mentor to adjust the timeline and complete assignments in a timely manner.		The site mentor will initial time log each week and sign the bottom of the time log at the end of the capstone experience. If deliverables are not completed on time, the site mentor will work with the student to adjust the timeline and complete assignments in a timely manner.
Collegiality/Resolving Disputes	-The student and site mentor will maintain respect, professionalism, and openly communicate throughout the capstone experience. -Student will work with site mentor to schedule a meeting to discuss the conflict if dispute occurred. Both parties will openly communicate and collaborate to come up with a solution. The student will document the		-The student and site mentor will maintain respect, professionalism, and openly communicate throughout the capstone experience. -Site mentor will work with student to schedule a meeting to discuss the conflict if dispute occurred. Both parties will openly communicate and collaborate to come up with a solution.

	meeting has occurred.		

Timeline of deliverables (adjust as needed throughout capstone experience):

Week	Deliverables
Week 1	Documentation of sensory techniques clinician uses in practice
Week 2	Documentation of sensory techniques clinician uses in practice. Written report of how clinician treats behavior during therapeutic sessions.
Week 3	Documentation of survey for needs assessment.
Week 4	Documentation of survey for needs assessment.
Week 5	Research SI and communication strategies used in practice. Conducting informal interviews with clinicians.
Week 6	Documentation of informal interviews with clinicians.
Week 7	Completion of definition and description section of coregulation techniques.
Week 8	Completion of comic examples of coregulation.
Week 9	Finalize pictures in comic. Complete statement on sensory processing and self-regulation as well as explanation.
Week 10	Work on vestibular and proprioceptive sensory piece and example.
Week 11	Finalize vestibular and proprioceptive piece and complete tactile.
Week 12	Guide will be completed.
Week 13	Final revisions will be completed.
Week 14	Present to capstone site and meet with capstone mentor to finalize project.

OTD Program Curricular Design:

1. **Understanding and utilizing occupation to promote health and wellness.**
    a. Sensory-based techniques and communication techniques will be used to promote children's health, wellness, and ability to self-regulate to enable participation in daily occupations at home and in school.
2. **Use of Evidence based practice to support the doctoral capstone project.**
    a. The student will review literature on current sensory and communication techniques that are beneficial for children with self-regulation difficulties, when developing the capstone project.
3. **Understanding and using professional ethics and values.**
    a. The student will understand the values and ethics of the occupational therapy profession, to guide the development, design, and implementation of the capstone project.
4. **Enhancing Advocacy and leadership skills**
    a. The student will demonstrate leadership skills through teaching and educating caregivers regarding techniques to utilize at home and in school. The student will improve her ability to communicate with parents on how to advocate for the child at school.
5. **Lifelong professional growth and development.**
    a. The capstone process will provide the student with opportunities to improve her professional skills. The student will be able to expand her knowledge and skill set during the capstone experience to prepare for the workforce.
6. **Enhancing diversity, inclusion, and cultural competence.**
    a. The student will take into consideration different cultural backgrounds when designing the capstone program, to enhance cultural competence. The implementation of the capstone project will foster inclusion and diversity of children with self-regulation difficulties.

Appendix 5: SENSES Program

The SENSES program can be found here:

Sensory Techniques

Coregulation Techniques

Appendix 6: IRB Approval

INSTITUTIONAL REVIEW BOARD

Mail: P.O. Box 3999
Atlanta, Georgia 30302-3999
Phone: 404/413-3500

In Person: 3rd Floor
58 Edgewood
FWA: 00000129

December 05, 2023

Principal Investigator: Sutanuka Bhattacharjya

Key Personnel: Bhattacharjya, Sutanuka; May, Nicole E

Study Department: Georgia State University, Department of Occupational Therapy

Study Title: Sensory and communication techniques to improve self-regulation among kids who were socially/emotionally affected by lockdown during COVID.

Submission Type: Exempt Protocol Category 2

IRB Number: H24255

Reference Number: 377000

Determination Date: 12/05/2023

Status Check Due By: 12/04/2026

The above-referenced study has been determined by the Institutional Review Board (IRB) to be exempt from federal regulations as defined in 45 CFR 46 and has evaluated for the following:

1. Determination that it falls within one or more of the eight exempt categories allowed by the institution; and
2. Determination that the research meets the organization's ethical standards

If there is a change to your study, you should notify the IRB through an Amendment Application before the change is implemented. The IRB will determine whether your research continues to qualify for exemption or if a new submission of an expedited or full board application is required.

A Status Check must be submitted three years from the determination date indicated above. When the study is complete, a Study Closure Form must be submitted to the IRB.

This determination applies only to research activities engaged in by the personnel listed on this document.

It is the Principal Investigator's responsibility to ensure that the IRB's requirements as detailed in the Institutional Review Board Policies and Procedures For Faculty, Staff, and Student Researchers (available at gsu.edu/irb) are observed, and to ensure that relevant laws and regulations of any jurisdiction where the research takes place are observed in its conduct.

Any unanticipated problems resulting from this study must be reported immediately to the University Institutional Review Board. For more information, please visit our website at www.gsu.edu/irb.

Sincerely,

Jamie Zaikov, IRB Member